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ILLINOIS HISTORICAL SURVEY
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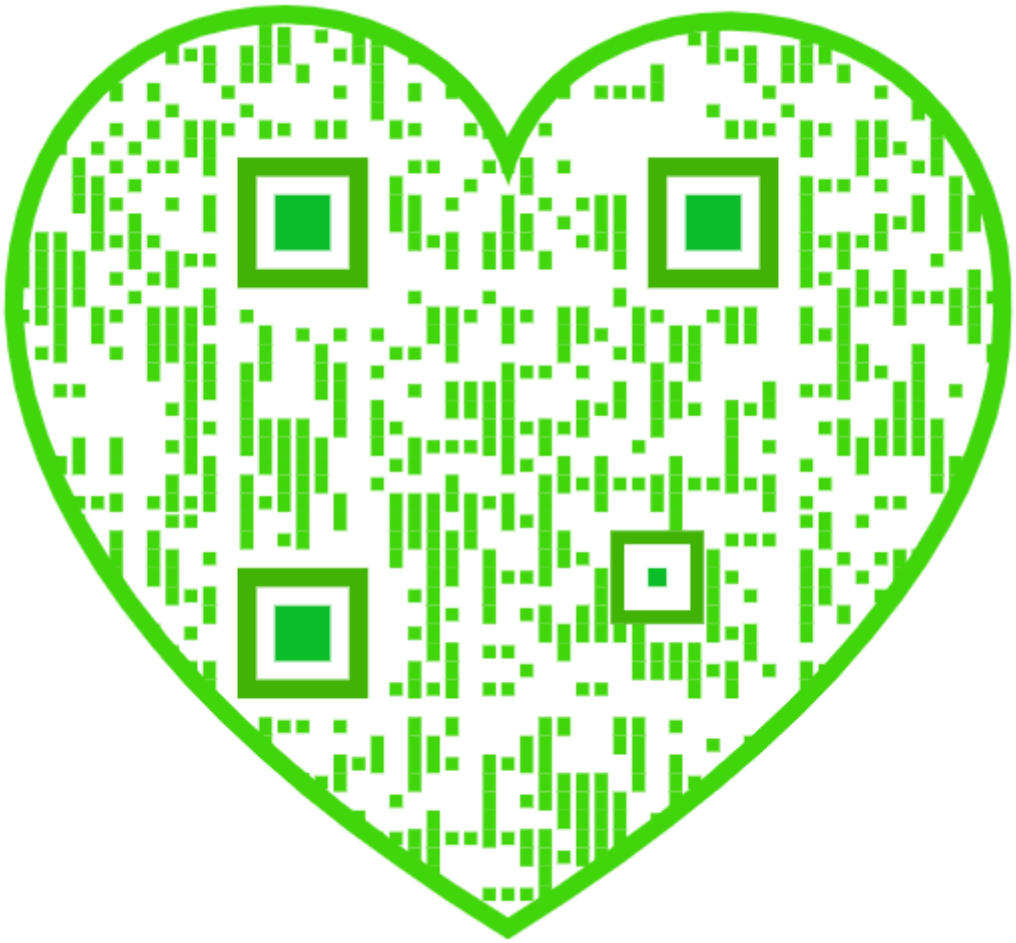
EXPLORING FOR MUSHROOMS

VIRGINIA S. EIFERT

ILLINOIS STATE MUSEUM

STORY OF ILLINOIS — NO. 3



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STORY OF ILLINOIS SERIES, No. 3

EXPLORING FOR MUSHROOMS

Some of the common mushrooms which are found in woods, in pastures, on lawns, and on trees in Illinois and the central states.

by

VIRGINIA S. EIFERT

Illustrations by the Author

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PREFACE

This book is intended as an introduction to a few of the commoner mushrooms found in Illinois and the central states. The book does not —nor could it in such a small space—attempt to identify all mushrooms in the region, for there are many hundreds native here. Besides, there are so many variations in mushrooms that individual specimens of the same variety may be unlike in appearance. There are giants and there are dwarfs; distortions frequently are found.

Yet the field narrows easily to these commoner varieties which are most interesting to the most people. To many, mushrooms first of all are a potential source of food. Since prehistoric times this has been true, yet at the same time they have been a source of illness and death when they were carelessly identified as edible. For this reason, any person who gathers mushrooms must know without question the name and quality of the kind he picks.

Because of the dangers attending the inexperienced gathering of mushrooms, the Illinois State Museum in publishing this book does not take responsibility in recommending any mushroom for food. Edible and poisonous qualities are indicated for those presented here, but this does not mean that the Museum vouches for the complete safety of all so-called edible species. This is a necessary precaution because many individuals have a sensitivity toward certain foods; a non-poisonous mushroom may cause a serious gastric upset in some persons.

Therefore, if you gather mushrooms for food, it is suggested that several comprehensive books on mushrooms, some of which are given here, be carefully consulted before any unknown species is eaten.

Meanwhile, however, the fascinating world of mushrooms with their strange forms and beautiful colors lies open alluringly to be explored. From the first Morels of springtime to the last Velvet-Stems of winter, there are mushrooms to be discovered in every season of the year. They are a part of the picture of woods and fields and lawns, part of the character of a great gaunt tree, part of the delight of a green bank of moss or a ferny ravine. There are many other ways to enjoy mushrooms than merely as an item of food.

The author is indebted to Dr. Verne O. Graham of the Chicago Academy of Sciences for a careful criticism of this manuscript and for numerous suggestions which add to its value. Thanks also are due to the people who, in the past several years, brought in many mushroom specimens for identification, and in so doing laid the foundation for this book.

Books Useful in the Identification of Mushrooms:

1. Christensen, Clyde M.—Common Edible Mushrooms. University of Minnesota, Minneapolis. 1943.
2. Graham, Verne O.—Mushrooms of the Great Lakes Region. Chicago Academy of Sciences and Chicago Natural History Museum, Chicago. 1944.
3. Krieger, Louis C. C.—The Mushroom Handbook. Macmillan Company, The. New York. 1936.
4. McIlvaine, Charles and Macadam, Robert K.—One Thousand American Fungi. Bobbs-Merrill Company, Indianapolis. Copyright 1911.
5. Thomas, William S.—Field Book of Common Mushrooms. G. P. Putnam's Sons, New York. Copyright 1936.
6. Gussow, H. T., and Odell, W. S.—Mushrooms and Toadstools. Dominion Experimental Farms. Ottawa, Canada, 1927.

FOR THOSE INTERESTED IN GROWING MUSHROOMS

1. *Mimeograph Bulletin V-3*
   New York College of Agriculture
   Department of Vegetable Crops
   Ithaca, New York
2. *Farmers' Bulletin No. 1875*—10c
   Superintendent of Documents
   Washington, D. C.

Illinois State Museum
Springfield, Illinois
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Virginia S. Eifert

THE STORY OF MUSHROOMS

In the mushroom world dwell some of the strangest and most interesting forms to be found in nature—forms which have a transient perfection and kid-skin texture unlike anything else in the world. Mushroom flesh has the coolness of an early summer morning, a freshness of things newly created, an odor which is that of damp, shadowy woods. Mushrooms are colored delicately or brilliantly—they may be orange as an oriole, green as moss, blue as lake water, brown as autumn oak leaves, red as coral, golden as butter, white as Indian pipe. These are like flowers, curious and beautiful, which are ornaments of fields, woods, and lawns. Mushrooms are a new world of fascination to explore.

With their strange forms and interesting flavors, they have been known and eaten by prince and peasant for a good many thousands of years, but during that long period of time no one seemed to know what a mushroom really was nor how it came to be. The general notion existed that these were manifestations of witches, fairies, or lightning bolts, and were akin to the supernatural.

Not until comparatively recent times did botanist finally agree that mushrooms were plants and belonged to the lowest of all plant groups, the Thallophytes—that they were not products of the supernatural, but the result of a simple form of reproduction. Their sudden appearance, rapid growth, and quick decay all found explanations under the impartial light of science.

The fungi include low forms of plants ranging from yeasts and molds to morels and puffballs. Each grows from a tiny reproductive body called a spore which forms in the mature plant. In some mushrooms, millions of spores are formed in gills beneath the cap; some form in pores or tubes or in corrugated walls under the cap; some develop in the mass of white flesh comprising the whole fungus; still other spores form in pits on the surface of the cap.

When a ripe spore falls in a place where there is moisture and decayed material, or where there is a break in tree-bark or wood, the spore sends out a tiny elongation which becomes a network of delicate white threads. This mycelium spreads in the ground or inside dead or living wood and may remain there for some time without any activity on the surface. Hidden from view, however, it develops tiny white buds, the embryo mushrooms.

In them, the entire mushroom is found in extreme miniature. When the proper warmth and moisture come to the mycelium, the bud-shaped body with its tremendous power of absorption takes in water which swells the tiny cells of the miniature mushroom bud. In the manner of a balloon, each cell expands.

Now suddenly there are mushrooms on the lawn. They seem to have appeared out of nowhere overnight, but the whole mushroom was completly formed underground and only spent its last few minutes in growing rapidly and in expanding. With a sort of hydraulic force, the mushroom cap grows, breaks through the ground, quickly

spreads to its full size as a mature fungus body. Soon spores ripen in the gills, are scattered, are blown away on the wind. Then, its cycle complete, the mushroom fades away.

Fungi are a necessary part in the economy of Nature. They are the scavengers of the plant world, the "vegetable vultures" which hungrily and incessantly devour dead plant and animal matter. They break it down so that it may return to the earth or air to nourish living plants.

Most fungi live on decaying matter—on dead animal matter in or above ground, on dead wood, or in old plant debris in the soil. Only a few live as parasites on living material. Some can be potent destructive agents in wrecking trees and buildings, yet as a group the fungi are essential in the economy of Nature which provides that everything links endlessly with everything else and that no creature is without its part in the scheme of life.

As food for man, however, mushrooms have an ancient history. It was the Greeks who developed the art of mushroom cookery, and because Greece itself was poor in native species, they were imported from Italy. When the Romans acquired the grosser elements of Greek culture, they looked upon mushrooms as great luxuries, called them "Food of the Gods," and developed intricate cookery rites which were accomplished with great ceremony, often at table by the gourmets themselves. Special utensils, created for cooking mushrooms, never were sullied by anything of a lesser nature. The Romans ate the Boletus and the Truffle, the Puffball and the Morel, the Agaricus and Caesar's Mushroom. The Emperor Claudius is said to have died from eating a dish of mushrooms, but in defense of his epicurean judgment and of his cook, it was stated that the dish actually had been poisoned by a lady assassin.

Fungi in the old days were not only used for food. Their medicinal uses, either real or fancied, continued to exist as the centuries of superstition drowned out even the lucid interval of Greek science. The old Greeks had used pieces of burning Fomes or Polyporus to cauterize wounds and ulcers. The Polyporus became known as a magical cure-all, a marvelous mushroom believed to have more power over the ills of mankind than anything else at that time. Its powers covered such widely different ailments as broken bones, sores, colic, bruises, liver complaint, asthma, jaundice, dysentery, kidney trouble, hysteria, epilepsy, and snake-bite.

By the beginning of the seventeenth century, the old beliefs about the efficacy of mushrooms as medicines continued unabatedly to follow the same rules that were laid down by Hippocrates and Pliny. In addition, people now were using dried Puffball to stop bleeding, and fumes from a burning Puffball were employed for their slightly anesthetic property in easing pain in operations. The Jew's Ear mushroom was used for throat inflammations; as late as 1884 in England, Lactarius was eaten as a fancied cure for tuberculosis. The Fly Amanita was taken for epilepsy and used as a narcotic. It was efficient in killing flies; it was applied also as a cure for ringworm infection. For a long time no one knew that ringworm itself was a fungus disease, nor that certain other ills known as ergotism, thrush, athlete's foot, and Madura foot all were caused by fungi. Nor was it known that other fungi were the root of difficulties against which

mankind struggled in a world which only slowly and by degrees he was beginning to understand.

Many human difficulties were attributable to fungi. The fungus plant diseases—the rots, dry rots, mildews, smuts, wheat rusts, bark cankers—have cost the world many millions of dollars annually and have been responsible for many disastrous crop failures and famines. Grape mildew ruined the vineyards of France until Bordeaux mixture was discovered as a remedy; the potato mildew ruined the potato crop of Ireland in 1846 and caused one of the greatest famines in history. In America, the combined fungus diseases, including peach-leaf curl, wheat rust, potato blight, and the oat, wheat, and corn smuts, have had a tremendous influence on the success or failure of American agriculture.

The members of the fungus kingdom are a power in the world. Weak though the individual plants may be, combined they present a powerful force in the mechanics of life and death. Since early in the beginning of plants in the world, fungi have been active forces in causing decay in dead material, silently crumbling and pulverizing it, breaking it up into its chemical parts, so that it eventually returns to air and soil in a perpetual round of life and death and life again.

In the early days of civilization, mankind made use of certain of these actions of fungi. In fermentation caused by yeasts, early men discovered how to make beer, alcohol, wine, and vinegar, and it was the yeast fungi which made possible the creation of something new in the world — raised bread.

Yet in spite of these benefits from the tribe of fungi, they were not always appreciated. Ever since man began to notice mushrooms and their queer forms and stranger actions—how they sprang up apparently over night from no visible origin, how in their mightiness they could even raise paving stones and heave up heavy clods of earth, and how they disappeared into the void from which they came — this tribe has been under suspicion. Much folklore and superstition for ages surrounded them. Mushrooms became as much a part of the standard equipment of sorcerers, witches, goblins, and fairies as magic wands or wings.

Today, mushrooms are looked upon in a more practical manner. They have become Big Business. Many people grow them in cellars, caves, or in abandoned mines; mushrooms are boxed and sold throughout the country. From *Agaricus campestris* the commercial variety of mushroom is derived. Its spawn is advertised in many seed catalogues; in the wild, it is found in pastures and on open hillsides, and it is a favorite with many mushroom-gatherers who recognize it by its delicate pink gills and kid-skin cap. Its flavor is a welcome addition to meats and sauces. Occasionally other wild species reach the market, among them the Morel, the Shaggy Mane, and the Boletus, but because of their fragility, comparatively few American mushrooms withstand shipping and market conditions.

Today one of the lowliest of the fungus tribe, the blue-green mold called Penicillium, has become one of the greatest single discoveries in the world of modern medicine. From this common mold which appears on old shoes, on cheese, bread, or citrus fruit, has come the wonder-drug Penicillin, whose action against infectious bacteria

and deep-seated bone infections is far more truly magical than any of the supposed properties of the sorcerers' mushrooms. This mold cures diseases ranging from virulent infections, chicken pox, meningitis, pneumonia, and carbuncles, to gas gangrene and osteomyelitis. The ancients may have had the right idea as to what a medicinal mushroom should accomplish; their difficulty was in finding the right mushroom.

These, then, are the mushrooms. They are a divergent tribe, one which today still is not completely known, and whose properties only are just beginning to be discovered. Yet all this background and history only step up the interest to be found in the mushroom on its bank of moss. Here in woods, gardens, lawns, and on trees are members of a wonderful kingdom. To collect them for their beauty alone is to learn the brilliant scarlet of Peziza and Lachnea, the deep blue of Indigo Lactarius, the insidious waxen white of the Destroying Angel. It is to find red and ivory Russulas on bright green moss, coral-like Hydnums, like a delicate deep-sea growth, against a blackened dead tree, or the lavender, yellow, white, or brown of Clavarias in a dark woodland. It is to find all the rest, the large and the very small, and know them for the part they play in the structure of the outdoor world. To find a mushroom is still to find a surprise that appeared over night, a fragile, cool, quickly aging piece of fungus flesh which is unique among creatures of the earth.

The Illinois State Museum shows a collection of authentic wax mushrooms made by Paul Marchand of Buffalo, New York. Some are placed in a three-season landscape, others in special cases, to illustrate some of the most beautiful and familiar of Illinois mushrooms.

THE POISONOUS MUSHROOMS

Old beliefs die slowly. Because the ancients fostered many superstitions about mushrooms and how to distinguish poisonous kinds from the edible varieties, many of the old rules still linger. Every year, too, there are deaths among those who followed too incautiously in the precepts of false legends.

There are so many of these that only some of the oldest and longest lived are given here. Horace in ancient Greece said: "Fungi that grow in meadows are the best; it is not well to trust others." But some of the deadliest grow in open lawns and pastures. Pliny said: "Mushrooms that remain hard after cooking are injurious." But some of the most poisonous are delicate, tender, and cook quickly. Athenaeus said: "Wholesome kinds are easily peeled, are smooth and readily broken." But many a poisonous mushroom will "peel," has a smooth cap, and a brittle stem.

There have been others who said that "A fungus nibbled by rabbits, squirrels, or slugs is edible." But slugs devour Deadly Amanitas and apparently are unaffected by a poison which is fatal to man.

Still another old tale said, "Fungi which blacken silver, or coagulate milk, turn parsley leaves yellow, or turn an onion brown or bluish, are poisonous and to be avoided." And this, too, like the others, is false.

The best way to tell a poisonous mushroom is to identify it by means of a book. There is no short-cut; each one must be identified separately; no rule covers them all.

However, the most highly poisonous group, the Amanitas, are characterized by having a thin cup around the base and a veil-like ring around the upper part of the stem. To be sure that the cup is present or absent in an unidentified specimen, the mushroom should be pulled from the ground, not broken off or cut above the base of the stem.

The Amanitas, those mushrooms with cups, are deadly. Until only recently there was no cure at all for Amanita-toxin, but a few years ago it was reported that the Pasteur Institute in Paris had developed an anti-toxin which often permitted recovery from Amanita poisoning. Formerly there was no hope of recovery in a case of poisoning from *Amanita phalloides* and several other members of the family.

Of the five kinds of known mushroom poisoning, the Amanitas belong to the group which causes a degeneration of cells and glandular tissue, and affects the liver and the nervous system. Since Amanitas do not have a noticeably different taste from other mushrooms, they may be eaten and the poison completely absorbed by the blood before any effects are felt. This seldom takes place before six hours have passed, and often not until fifteen hours after eating; by that time the poison cannot be reached with an antidote.

Another type of poisoning found in certain mushrooms paralyzes the nervous system, causes serious gastric disturbances, delirium, and lack of control. This poisoning sometimes, but not always, is fatal.

Still others are gastric irritants; another, such as the poison found in Gyromitra, destroys the red corpuscles of the blood, causes vertigo, vomiting, and convulsions, and may be fatal. It is said that insufficient cooking or soaking may be the reason for these effects from eating Gyromitra, but whatever may be the cause, this type of helvellic poisoning has caused many deaths. A fifth type of poisoning excites the muscular system but is not deadly.

Aside from those known to be poisonous, there are certain mushrooms which only affect certain individuals, while others for years may have eaten the same species without any ill effects. In addition, a mushroom when gathered for food should be taken when it is perfectly fresh and firm, never blackened, nor when it has the tiny perforations inside which indicate the presence of minute, white, wormlike larvae.

If, however, in spite of caution, one becomes ill from eating mushrooms, a doctor should be called immediately. He should be told the nature of the illness before he comes.

It would appear that there is great danger in eating any mushroom, yet in all the thousands which grow in the world, only a very few are poisonous. Many others are not poisonous but because of toughness or other qualities are not considered fit for food. The majority, however, not only are non-poisonous but are edible. A great many of these do not conform to the popular notion of what constitutes a good mushroom, for some of the most vividly colored and the most fantastically formed are considered delicious by mushroom fanciers, while some of the most innocent-appearing species may be deadly.

For those who are interested in mushrooms as food, the use of caution, judgment, and a little investigation will reveal a few simple, safe species which are not easily confused with any others. It is these with which the amateur should begin. There are too many perfectly safe and unmistakable mushrooms in America for anyone to experiment, or to sample the questionable varieties, or to risk possible death with those that are downright deadly.

MUSHROOMS AS FOOD

The reward of learning unfailingly a few unmistakable wild mushrooms is the pleasure of cooking and eating them, and in knowing that they are safe to eat. The sure eye that instantly recognizes a poisonous variety and never mistakes it for an edible species is the first and most vital ingredient in mushroom cookery. As for the cooking itself, wild mushrooms need a gentle hand and a careful attention to seasoning in order to be at their best.

Only firm young mushrooms should be gathered, never those with blackened gills, for these may darken and spoil the entire dish. Because small white larvae often live in the fleshy parts, each questionable mushroom should be cut in half through the stem and thick portions of the cap to see if there are tiny holes, indication of the presence of insects. Some mushrooms are host to black beetles that live between the gills or in the flesh. The tougher fungi should be soaked in salt water for half an hour to remove possible insects from gills and tubes. Morels or Sponge Mushrooms should be split and soaked in salted water to remove the tiny, whitish, hopping insects that sometimes lurk in the pits or inside the stem.

It is not necessary to peel most mushrooms, unless the skin is soiled beyond cleaning with a knife, nor is it necessary to wash a fresh mushroom that has just been gathered in the wild, except when bits of earth or other debris cling to it. The idea is to treat them lightly, prepare them with the least amount of handling, and cook them quickly. In this way, their flavors are retained—those unique flavors which are subtly different in each kind of wild mushroom.

According to their tenderness or toughness, mushrooms fall naturally into several groups, so that the methods of preparing them for food depend upon their classification.

The tender mushrooms should be cooked quickly and simply. They are fragile and if cooked too long they may become a soft pulp which may blacken and be spoiled for food. The simplest method is to sauté them five minutes in butter, and season with salt and pepper. They may be served on toast or added to many other dishes. Or fry them with steak, chops, or hamburger patties, and serve with the meat. Still another method is to add them to gravy in the last ten minutes of its cooking.

The tender mushrooms usually are high in flavor, which sometimes is best retained to its fullest degree by simply stewing them for ten minutes in milk and seasoning with butter, salt, and pepper. This may be served as a soup, or thickened as a cream sauce.

Mushrooms which usually are prepared by these methods are the following:

Boletus (p. 21)
Hypholoma incertum (p. 40)
Inky Cap (p. 43)
Mica Cap (p. 43)
Pasture Mushroom (p. 39)
Shaggy Mane (p. 42)

Another group of wild mushrooms comprises those which are neither as delicate in texture nor as perishable in form as this first group. In some of these the stems may be too tough and fibrous to eat. If they are not, they may be used with the caps.

Most of these mushrooms may be prepared by the preceding methods, but often require longer cooking. Frying the caps in butter or with meat, however, is often most satisfactory. Or large caps may

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be broiled. They should be placed, gills up to the flame, beneath the broiler, a bit of butter placed in the hollow left by the stem, and the gills dusted with salt and pepper. Most of these species broil quickly and should be removed at once and served on a heated platter, perhaps as an accompaniment to meat.

These may be broiled:

Boletus (p. 21)
Collybia radicata (p. 34)
Parasol Mushrooms (p. 25, 26)
Pasture Mushrooms (p. 39)
Pluteus (p. 37)

These may be cooked with meat:

All the preceding species.
Brick Tops (p. 41) long, slow cooking.
Fairy Rings (p. 32)
Morels (p. 13)
Puffballs (p. 45)
Russulas (p. 30)
Velvet Stems (p. 35)

In still another group, the mushrooms are firm and often tough. They require long, slow cooking at low temperatures. The usual method is to stew them in bite-sized pieces in a small amount of water until tender, and then thicken them with milk, butter, flour, salt, and pepper. These mushrooms will withstand a good deal of handling, and the Polyporus are the better for having been washed and soaked for half an hour in salted water before being cooked.

These mushrooms need long, slow cooking:

Brick Tops (p. 41) Use only young caps
Chantarelle (p. 29) Use only large, crisp specimens
Chicken of the Woods (p. 18)
Hen of the Woods (p. 17)
Honey Mushroom (p. 27) Parboil, then fry in butter.
Polyporus (Leafy and Sulphur) (p. 17, 18)
Sulphur Mushroom (p. 18)

Certain mushrooms may be dipped in batter made of beaten eggs, milk, flour, salt, and pepper, and fried in butter or other fat until tender and crusty.

These are adaptable to this method:

Oyster Mushroom Morel Sulphur Mushroom

Many mushrooms, especially those which are tender yet which do not disintegrate in cooking, may be baked in a casserole. The caps (the sliced stems, too, if they are tender) may be laid in layers in a buttered baking dish, alternating with buttered crumbs, salt, and pepper, and a small amount of milk or cream. Bake at 400 degrees for about 30 minutes, or until the caps are tender.

These may be baked in a casserole:

Boletus (p. 21)
Collybia, Rooting (p. 34)
Fairy Rings (p. 32)
Morels (halved) (p. 13)
Parasols (p. 25, 26)
Shaggy Manes (p. 42)

Puffballs (p. 45) are in a group of their own and require their own sort of treatment in cookery. Although all are edible, the larger the Puffball is, the better the flavor seems to be. Only the solid white meat is usable. Cut off the stem end, remove the brittle skin, cut meat in thick slices, and fry in butter. Or dip in batter and fry, or prepare in a casserole with cracker crumbs, butter, salt and pepper and plenty of milk.

Morels. l. to r.: ***Morchella esculenta, Morchella semilibera.*** **Edible. Spring.** ***2/3 nat. size.***

The Morels

Into the warming woods of late April and early May there come the first mushrooms of the new season. Among the most famous are the Morels, which for centuries both in America and in Europe have been a favorite food. They prefer to grow in the loose, leaf-moldy soil of old orchards, under elms, and in burnt-over ground.

Morels come when woods have wakened to springtime. Waxen and sculptured, the corrugated, gray-brown conical tops push through the loose woods-earth and stand upright on hollow white stems. All around them is the growth and song of spring. Small crisp ferns unroll on the hill; spring beauties that grew in a drift of white through the woods now thrust their last blossoms of the year into the sunshine; mayapples are tall, and overhead the oaks bloom.

Into this atmosphere come the Morels, to stand briefly in the woods while weather, moisture, and warmth are right. If it is too cool, they will be scarce and stunted; if it becomes warm too quickly, they are dry and burst of their own burgeoning growth.

The Morel often is called the Sponge Mushroom. When cut in half, the entire mushroom from top to base is hollow and white inside; this is one of the best proofs of its identity. There are several kinds, the conical *Morchella deliciosa,* the more egg-shaped *Morchella esculenta,* and the small, thin, *Morchella semilibera* with its shallow, abrupt, loose cap. All Morels are edible.

Gyromitra. *(Gyromitra esculenta) Poisonous.* Spring. ½ *nat. size.*

Gyromitra

At the same time that the Morel appears in the springtime woods, there comes a strange heavy mushroom which sometimes, though without good reason, is confused with the delicate, light-weight Morel. This is the Gyromitra. It is a semi-solid fungus whose stout stem is pure white and corded, as if it were made up of a group of smaller stems fused together. The top is deeply furrowed and twisted, not pitted as in the Morel, and it is chestnut-red or red-brown, moist, and brittle. Inside, the Gyromitra is almost entirely solid; it is heavy in the hand and when dropped shatters into pieces.

Although this mushroom has been safely eaten by many people, it is one to be avoided. It contains the deadly helvellic acid which dissolves the red corpuscles in the blood and, when taken in quantity, generally is fatal. It is said that soaking or boiling will destroy helvellic acid; this may be the reason why some people are able to eat the Gyromitra without any ill effects.

Although it is a poisonous mushroom, the Gyromitra may be discovered in the woods and enjoyed as part of the picture of springtime. Here in this setting the magnificent chestnut color of the Gyromitra's sculptured cap and the ivory columns of the massive stem are part of an unforgettable picture.

Top: Black Urnula *(Urnula craterium)*. Bottom: Scarlet Cups *(Peziza coccinea)*. Right: Jew's Ear *(Hirneola auricula-judae)*. Non-poisonous. Spring. *2/3 nat. size.*

Early Mushrooms of the Woods

It is early spring—winter is so close that even now there are white frost crystals on the north side of an old log and under stones on the north slope of the hill. Yet it must be spring because there are Scarlet Cups in the woods—Scarlet Cups, Black Urnulas, and the brown, gelatinous quiver of Hirneola, the Ear Fungus.

The Scarlet Cup is one of the rare red things in the woods, and, as with most of them, it is hidden from the casual glance. Nature puts the scarlet tanager high in well-leafed trees; hides the scarlet water-mite in a muddy pond; puts the flaming spikes of cardinal flower in remote swamps. And Nature in March places the Scarlet Cup Mushroom beneath a log, so that the color seldom is found except by snails and passing salamanders, by beetles, and big-eyed deer mice.

The Scarlet Cup is a Peziza. It may range in size from half an inch wide to a width of three or four inches, and varies from an almost globular cup to a flat saucer with tattered edges. Outside, it is white kid-skin; inside, it is a brilliant, glowing scarlet.

l. to r.: Coral Hydnum *(Hydnum laciniatum)*, *Hedgehog Hydnum (Hydnum erinaceum)*, Clavaria species. All edible. *1/3 nat. size.*

Corals, Clavarias, and Hedgehogs

It is autumn and in the dark woods on a sunless day the brilliance of white mushrooms shines in the gloom. All about there is a brooding silence; the leaves have fallen; the migrant birds have gone, and the creak and cheep of insects are stilled. But silently in the cool, moist atmosphere of autumn the mushrooms have grown, have thrust forth from old log and hollow tree, from earth and from twig.

Against the dark wood of a rotted log there is a spreading, delicate, cluster of Coral Hydnums. They are fragile yet sturdy; they are pure white like sea corals; they are cool with that elfin aloofness of mushrooms. They are divided into infinite bits and tatters of mushroom flesh which forms the branching of the Coral Hydnum. Nearby there may be the mass of white or ivory of the Hedgehog Mushroom whose divisions are straight, thick thready growths that hang in orderly tiers. And on the ground may be the Clavarias with their coral-like stems in masses, in groups, or in single spikes.

Clavarias are white or ivory or pale yellow; or they may be bright yellow, orange, brown, or a delicate lavender. They, like the Hydnums, resemble deep-sea growths, seeming too fragile to exist outside the depths of the ocean.

Leafy Polyporus. *(Polyporus frondosus).* ½ *nat. size.* Edible. Summer, autumn.

Hen of the Woods

Particularly when autumn rains have brought life to the woods and have started into activity the growth of mushrooms, many old logs and rotted stumps produce amazing growths of fungi.

One of the largest mushrooms to grow on wood is that known as Hen of the Woods, the Leafy Polyporus, or *Polyporus frondosus.* It is a mass of thick, cool leaf-shaped parts attached to a solid white core and arranged circularly in a giant rosette. The upper surfaces of the leaf-shaped parts usually are pale brown, pale gray, or darker smoky shades; they are pure white beneath and are covered with fine pores. They are tender when young, tough when old, and they are among the safest and most unmistakable of edible mushrooms.

The Hen of the Woods emerges as a massive growth on an old stump or log in which one spore has lodged, has sent out a tiny root of mycelium, and has spread into the dead wood to devour it. As a fleshy body, the leafy part emerges and day by day grows larger. It is of slower growth than many of the capped mushrooms and so it often lasts for many days. Some of it may be cut away for a meal and the rest allowed to grow, for some of these growths would fill a bushel basket if gathered all at once.

Sulphur Mushroom *(Polyporus sulphureus)*. Edible.
Summer, autumn. *1/3 nat. size.*

Sulphur Polyporus

When the great black trunk of an oak suddenly bursts forth with a magnificent growth of shelf-shaped, fluted, orange, yellow, and pink Sulphur Mushrooms, the sight is undeniably beautiful, but the tree doubtless is doomed. The spores of a Sulphur Mushroom have entered a break in the bark and have grown until the mycelium fills much of the interior of the trunk. In the manner of flowers, the mushrooms themselves are the visible fruiting part of the fungus; they appear for the sole purpose of making more spores.

These fungi are a treat to the gourmet who enjoys Sulphur Mushrooms on his table, and a treat to the eye which enjoys pure color. The delicate shading and blending of colors in this mushroom are unparalleled in the fungus tribe. The brackets are light sulphur yellow beneath. Above, they are decorated with bands of orange and salmon-pink shading into canary yellow, and the edge often is fluted and crinkled. The mushrooms form rosettes or tiers of brackets, and stand out in all their colorfulness against the dark oak bark. Most frequently it is the red oak which is host to the Sulphur Polyporus.

For the one who likes good food, the Sulphur Mushroom often is considered a delicacy, and should be gathered when it is young and tender.

Top to bottom: *Daedalia quercina; Polyporus cinnabarinus; Schizophyllum commune.* Right: *Polystictes* and *Guepinia.* Non-poisonous. ½ *nat. size.*

Tree Fungi

In this world of living things, there is hardly a dead tree, hardly a log, hardly a stick or stump that does not have its mushrooms. Some species attack a living tree and eventually cause its death. The majority, however, pursue their part in the economy of the woods by devouring the fibers of dead wood. Mushrooms break down old wood so that eventually the decayed substance returns to the earth.

Some of these are the woody mushrooms of the Polyporus family. They are non-poisonous, but most of them are so tough no one could eat them, and so they stay as decorations on tree-trunks and logs. A Polyporus is recognizeed as such by its under surface which is covered with tiny pores—the name *Polyporus* means "many pores." Some members of this family are white, some brown, some gray, some bright orange.

Daedalia resembles other members of the Polyporus family from above, but is different beneath; instead of pores it has a maze of twisted walls beneath its cap. And with the Daedalia may be the little, furry, white, shell-shaped Schizophyllums that grow in colonies on old wood and are among the beautiful mushrooms of the woods.

With them often is the thin, leaf-shaped Polystictes which is related to Polyporus but has almost microscopic pores. Above, it is colored with bands of wood browns that glint like satin in the sun.

Bottom: l. to r.: Earth Star *(Geaster hygrometricus)* Birds' Nests *(Crucibulum vulgare* and *Cyathus striatus)*. Top: Pine-cone Mushroom *(Strobilomyces strobilaceus)*. ½ *nat. size.* Edible. Autumn.

The Earth Star

One of the most interesting of mushrooms is the queer little Earth Star. It lies on loose soil or sand, and in dry weather is a globular, dry little fungus without a stem; it is attached to the soil by means of a thready little root-like base. Around the puffball-like center are folded petal-like sections, four to eight, and the usual size of the whole thing may vary from an inch across to almost four inches. But when moisture comes, the petals of the Earth Star grow turgid with water and bend back until they form a star or flower-like shape around the upstanding central ball which contains the spores.

Perhaps in that same bit of woods there will be the Pine Cone Mushroom which has a charred appearance, as if it had gone through a forest fire, but had survived with stem blackened, cap cracked and burnt like a scorched marshmallow. This is the natural appearance of the Pine Cone Mushroom. It is a large fungus, related to the Boletus, and has gray or black pores beneath a thick, spongy cap.

Not only in the woods but in gardens and shady places there may be the tiny, non-poisonous fungi called Birds' Nests. They, too, are like something from the world of elves. The Birds' Nest fungi may be shallow "nests" filled with tiny white "eggs"; a thin skin which encases spores makes the "egg," which is attached to the wall of the "nest."

l. to r.: Yellow Boletus *(Boletus luteus)*; Two-colored Boletus *(B. bicolor)*. Edible. Summer, autumn. *2/3 nat. size.*

The Boletus

The Boletus family is among the brightest colored of the mushrooms. They come usually in late summer and autumn, and bring bright color to shadowy woods and to mossy banks and ravines. On a bank of starry moss there may spring up a mushroom with a bright scarlet top and green-yellow pores beneath, and a yellow stem shading into russet at the base. When bruised a bit the yellow pores rapidly turn a bright greenish blue. This is *Boletus bicolor* and it is considered edible.

Since plants and animals belong in groups—oak woods, maple woods, tamarack bog, open prairie—which form ecological patterns of relationship to each other, mushrooms also have their part in certain environments. Therefore, when Illinois, as a soil conservation and reforestation measure, planted large tracts of Scotch and jack pines in certain regions, a mushroom hitherto not commonly found in this locality began to appear. A few years after the pines had made a thick mat of old needles on the bare prairie ground, the large Yellow Boletus, native of pine forests, in autumn appeared in numbers and continues to do so. It is a large fleshy, edible mushroom with a bright, glazed, mustard-yellow cap on which pine needles cling; there are yellow pores and a stout, pitted stem.

l. to r.: Spring Amanita *(Amanita verna)*; Fly Amanita *(A. muscaria)*. Deadly poisonous. Spring, summer. *2/3 nat. size.*

The Deadly Ones

The Amanita mushroom is deadlier than a rattlesnake—there is possibility of recovery from a rattlesnake bite but from the venom of one of these beautiful fungi there is little chance of survival.

These are the mushrooms, therefore, which, above all others, make extreme caution necessary in gathering wild mushrooms for food. Only one small button of an Amanita is enough to kill all who eat of that dish of mushrooms. Yet once they are known, Amanitas may be avoided as easily as one would step aside to avoid brushing against poison ivy.

It is not difficult to know an Amanita. It is a graceful, rather tall, capped mushroom with gills, and there is a ring around the stem which, in most specimens, hangs down in a sort of veil. There is a cup at the base, but sometimes the skin of the cup clings to the stem so that as a cup it is not too noticeable. Sometimes the stem is embedded in the earth and the cup is hidden. This is why mushrooms should be dug, not broken off above the ground.

The Deadly Amanita or Destroying Angel (*Amanita verna*) is pure white; its ring is a veil hanging around the upper part of the stem. *Amanita phalloides* is much like the preceding but has a smoky color on the cap. The Fly Amanita is a bright sulphur yellow and orange, with flakes of white on the cap. The telltale cup is at the base.

Amanitopsis vaginata. Non-poisonous. Summer. *2/3 nat. size.*

Amanitopsis

The Amanitopsis is one of the confusing proofs produced by Nature apparently to disprove rules. The rule which is broken here is that all mushrooms with a cup at the base are poisonous. The Amanitopsis has a sheathed cup at the base—and is edible. But because of the danger of mistaking it for an Amanita in some of its forms, the Amanitopsis should be avoided as carefully as the Amanita when mushrooms are gathered for food.

Putting the idea of food aside, the Amanitopsis may be looked at for what it is, a slender-stemmed, simple mushroom growing from a bed of moss or in a dry grass space in late summer. The sheath around the stem-base is noticeable, but unlike the Amanita with its graceful veil around the upper part of the stem, the Amanitopsis stem has neither ring nor veil. The cap is gray-white, or darker gray, or gray-brown on top, sometimes glossy and slightly ribbed, and the gills beneath are white. The gills are not attached to the stem.

This is the Amanitopsis. Around it the changing picture of late summer merges into autumn. Robins with fresh new plumage and conspicuous white eye-rings run on the ground, which has revived under autumn rains. Asters bloom beside the road and there is a multitude of mushrooms in the woods.

Three stages of *Lepiota morgani*. Poisonous. Summer, autumn. *2/3 nat. size.*

The Green-Spored Parasol

In mid-summer the great stout Parasol Mushroom (*Lepiota morgani*) appears in pastures and on lawns. It is a big, edible-smelling fungus that has misled many a person into using it for a meal. Many people have been poisoned by it. The Lepiota, however, seldom causes death unless the person who eats it is greatly weakened anyway from some other illness.

The Green-Spored Parasol resembles in some ways the more delicately built, slender-stemmed Parasols which are edible. But unlike them, the Green-Spored Parasol is very large and heavy. At first it is creamy white throughout, with brown scales breaking away picturesquely on the expanding cap; later the white gills turn pale green, still later a green-brown. At first the form of the cap is about the size and shape of a small teacup, is covered with broken scales, and is perched on a stout stem. As it grows, the cap opens and expands into a typical parasol-shape. Sometimes it is ten inches wide; the average width is six or eight inches. The stem is stout, larger at the base, with a movable white ring around the stem about half way between base and cap.

The Green-Spored Parasol often grows on lawns and in open, grassy pastures where the gleaming white caps stand up elaborately all about. It is most common in late summer and early autumn.

American Parasols *(Lepiota americana)*. Edible. Summer.
2/3 nat. size.

American Parasols

The old stump once was part of a maple which grew beside a city street, but when the tree rotted inside and was felled, the shell of a stump remained. Yearly now it is host to more and more mushrooms of many kinds which grow from the wood itself or from the rich soil around the base.

From this soil nourished by the old tree, there grow American Parasol mushrooms which range in size from close-shut buttons to broad-spread umbrellas. There against the old tree trunk their caps are bright. They are patterned with bright chocolate-brown or rosy-brown scales which are densest around the apex.

The broad gills are white and are not attached to the stem—this is one means of identification. The stem itself tapers to the point where it joins the cap, but expands and is club-shaped at the base. As if it had been dipped in dark red wine, the stem is a vivid ruddy color below. When bruised, the cap, gills and stem turn reddish, and this color appears when the American Parasol is cooked. When dried, it is a reddish brown. This coloring perhaps is the best distinguishing mark of the American Parasol.

To the eye which likes beauty of color and form, this sculptured bit of fungus flesh is magnificent as it stands with green grass around it, against the warm color of the old stmp. Here is color, form, and a certain indefinable dignity represented by a lowly tribe.

Common Parasol Mushroom *(Lepiota procera)*. Edible. Summer, autumn. ½ *nat. size.*

More Parasols

Among the ferns it stands, the delicate brown Parasol Mushroom. So well does it fit into the picture of the woods that it may be invisible to the casual eye. The Parasol is as much a part of the woods as the ferns themselves, as the sunlight among the trees, as the voice of the vireo talking somewhere among the leaves.

The Parasol may not only grow in the woods, but comes at times to pastures, lawns, and open places. It is a large mushroom of graceful form; its slender stem is long; the cap at first is cup-shaped, then opens wider. It has a hump at the top directly above the place where the stem meets the cap. There is a delicate ring around the stem, and in old specimens the ring may be moved up and down.

In color this Parasol is akin to the delicate patterning of a deer, or a thrush, or a Polyphemus moth—all are a blending of exquisite shades of brown. In the mushroom, the brown is deepest and most concentrated on the hump or umbone of the cap. The pale brown skin, as it expands, cracks into thin flakes of brown arranged concentrically on the expanding cap. As if painted with a thin camel's hair brush, the stem is marked with narrow bands of brown on paler brown or cream. The base of the stem swells out where it meets the earth and is stained a bit with leaf-mold.

This is the brown Parasol. It is edible—mushroom fanciers consider it one of the very best.

Honey Mushroom *(Armillaria mellea)*. Edible. Summer, autumn. *2/3 nat. size.*

The Honey Mushroom

The Honey Mushroom is a slayer of trees. Its abundant colonies emerge from living wood as well as from dead wood; it is one of the most destructive of the gill fungi in attacking live trees. This role usually belongs to the pore fungi—this job of eating out the heart of a tree—but the Honey Mushroom joins the Polyporus in orchards and forest trees, as well as in trees of town and garden.

Yet a growth of Honey Mushrooms on a tree is a striking sight. Particularly in autumn when the woods are dark and cool, the pale yellow, yellow-brown, or whitish caps of Honey Mushrooms burst forth and crowd upon a fallen tree. The caps are flecked with tiny dark hairs in little tufts; these brush off or wash off in a rain, so they may not always be visible or present. The gills join the stem and run partly down it; the stem itself is fibrous, sometimes hollow when old, and at first has a thin whitish ring which tears away and finally disappears.

The Honey Mushroom is so variable that it is not always easy to identify. Still, as in all things, there are certain distinguishing points which set it apart from other species. One of these is the manner in which the little dark tufts of tiny hairs stand up on the one-to-three-inch cap. Another is the white flesh; still others, the gills which are attached to and run down the stem; the cottony pale ring; the fibrous, spongy stem.

Jack o' Lantern Mushroom ***(Clitocybe illudens).*** **Poisonous. Autumn.** ***½ nat. size.***

Jack O' Lanterns

In large, colorful, pumpkin-hued masses come the Jack o' Lantern mushrooms. They are so luridly colored, so extreme in their form and growth, that they do not attract one to eat of them, but rather to admire and marvel. It is well to go no further than this with the Jack o' Lantern Mushroom because it is poisonous. It is not deadly, but is dangerous enough to be completely avoided as food.

With this point dismissed from the subject, the Jack o'Lantern is entirely artistic; it is a striking mass of glowing color in the woods. It is a pure, bright orange-red or golden orange throughout, the flesh usually a trifle paler in the thick portion of the cap. The gills are broad and deep; they extend well down the tapering stem, and the stems of the entire cluster usually all spring from a central point.

This mushroom comes in late summer and lasts until cold weather in autumn; it grows on dead wood, old roots, and stumps.

Not only is the Jack o'Lantern colored like a pumpkin, but it has a peculiar quality of phosphorescence which permits it to glow in the dark; this still further gives it kinship with witches, pumpkin-heads, and black cats on Halloween. In the old days, it was believed that the Jack o'Lantern Mushroom really was supernatural, and that it was part of the midnight cavortings of witches, gnomes, and spooks.

l. to r.: White Clitocybe *(Clitocybe candicans)*; Chantarelle *(Cantharellus cibarius)*. Edible. Summer. *2/3 nat. size.*

Clitocybe and Chantarelle

When the woods come alive with mushrooms in autumn, some appear early while the weather is warm, and others remain until well into November when nights are cool and the days contain the scent and sound indicative that years may end.

It is then that among the tumbled dry leaves on the ground, which form an intricate pattern of leaf-brown, there spring up the wax-white *Clitocybe candicans* and many more. Some are edible, some not; this particular little Clitocybe so closely resembles a poisonous species that it should be let alone. *Clitocybe candicans* is pure white throughout. The cap sometimes is round, sometimes fluted or shaped irregularly, slightly or deeply funnel-form, and the thin white gills extend down to and merge with the polished little stem.

Sometimes with them early in the season, sometimes in mossy places or alone on a knoll, are the bright yellow Chantarelles. These, in spite of their violent color, are edible and are rather easily recognized by their peculiar shape. The yellow cap is fleshy—the meat inside is white —and soon becomes expanded and then depressed in the center so that it is funnel-shaped with the forked gills running down the outside of the funnel and merging with the stem. There upon its bank of forest moss, the Chantarelle is one of the most colorful of mushrooms.

l. to r.: Purple Russula *(Russula purpurina)*, Inch Russula *(R. uncialis)*. Edible. Summer. *Nat. size.*

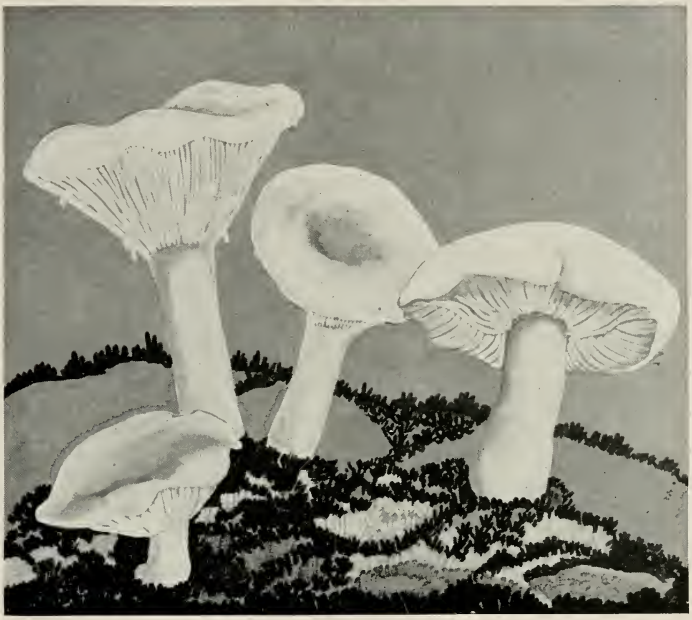
The Russulas

On a bank of crisp green moss where ferns grow and the snails creep past on a dewy morning, the jewel-like summer mushrooms spring into being. They stud the woods with color in summer and autumn, set unbelievable hues on the dark floor of the woods.

These are the Russulas. Some are edible, some poisonous; most are so difficult to distinguish that unless they are carefully studied and collected with care, they must be avoided as food. Russulas are not for mushroom amateurs. But the advantage of enjoying mushrooms with the eye is obvious here, for Russulas are among the most beautiful of all fungi.

A Russula is known by its brittle white gills and by the absence of veil and ring. Some members of the group have a sharply contrasted color scheme of red and white which is striking to see in the woods, especially when, as if planned, they grow on a rich bed of Catharinea or Mnium moss.

Chief of the poisonous Russulas is *Russula emetica* with its bright red cap, its white gills, and white stem; the cap does not peel. *Russula foetens* also is inedible; it is yellowish on top and often is depressed in the center of the cap. The majority of the Russulas, however, are edible, among them *Russula purpurina* with its pink-purple cap and white gills, and the little Inch Russula *(Russula Uncialis)* with its faded reddish cap and white gills.



Left: Peppery Lactarius *(Lactarius piperatus)*. Edible. Far right: White Tricholoma *(Tricholoma album)*. Poisonous. Late summer, autumn. *2/3 nat. size.*

Lactarius and Tricholoma

There are many white mushrooms in woods and fields, white mushrooms that are as if made of wax, perfect of form, carved of cap, with their gills carefully arranged in patterns indicative of each species.

Among them are members of the genus Lactarius—the Milky Mushrooms. When scratched or broken, or even bruised, a Lactarius emits a thick, milky juice which hangs in droplets on gills or cap.

In this group is the Peppery Lactarius. When raw, the milky juice has the fire of cayenne pepper, but this is subdued by proper cooking. Although the Peppery Lactarius is white, the cap in pushing through the woods-earth often comes up with debris on its top. The gills are very thin and are set close together, sometimes are forked, and they stop abruptly at the stem. The cap sometimes is funnel-shaped or only depressed in the center, while others are flat.

Although with proper preparation the Peppery Lactarius is good to eat, the White Tricholoma in contrast is considered entirely inedible and is very likely poisonous. It is white, smooth, sometimes stained yellowish or grayish, and the margin, regardless of the shape of the rest of the cap, is turned inward, a rolled edge unlike that of the Lactarius. The flesh is white and bitter, the gills close together and pure white, the stem solid throughout. The cap, unlike many mushrooms, is dry on top.

Fairy Ring *(Marasmius oreades)*. **Edible. Summer.** ***Natural size.***

Fairy Rings

When rains come in summer, mushrooms spring up all about. They appear on lawns and in the cracks of pavements, in woods, fields, and roadsides, on dead and living wood. In the grass at this time there may spring up quantities of small, pale brown, edible mushrooms, the Fairy Rings.

The stems of these mushrooms are tough and fibrous, the caps soon flattened or upturned, the flesh rather cartilaginous. The gills—and this is a guiding mark—are widely spaced, and between them are crinkled walls and fleshy cross pieces. From the fresh mushroom, as well as from broken pieces, there is an odor of peach-pits.

Sometimes other mushrooms grow in the typical "fairy ring" formation, just as the Marasmius does; perversely, too, the Fairy Ring itself often grows here and there in scattered fashion and does not always form a ring. In the old days when folk believed in the Little People, it was sincerely thought that where the fairies danced the night before, a fairy-ring of mushrooms sprang up. Some said that only within this ring could fairies be seen; that the Devil churned butter inside a fairy ring; that it was caused by the scorching breath of dragons. Today, however, it is believed that a fairy ring actually is a disease of the grass. A heavy growth of mycelium spreading outward in all directions stunts the grass and causes mushrooms to spring up circularly in an ever widening ring which may exist for several hundred years.

Oyster Mushrooms ***(Pleurotus ostreatus and P. ulmarius).*** **Edible. Summer, autumn.** ***½ nat. size.***

Oysters

On elms and poplars and some other trees, usually in decayed places or upon dead trunks and stumps, the white Oyster Mushroom, the Pleurotus, appears in damp weather. Some of these are a smooth, ivory white; others have ivory gills and a pale gray-brown cap which is very smooth and moist. The gills of all species of Pleurotus are forked and are rather deep and broad. The Oyster Mushroom usually is oval in shape with a short, thickened stem at the side of the cap.

Some Oyster Mushrooms, however, have a more centralized stem. In the large Elm Pleurotus *(Pleurotus ulmarius)* it usually springs at a curve or a peculiar angle from the tree.

These are tree fungi; they subsist on wood. They are edible, though care must be taken in gathering only fresh specimens.

Oyster Mushrooms are among the commoner kinds to be found in town and garden; any decayed place on certain trees is apt to be host to them. In damp weather they gleam waxen and white against the dark trunk, sometimes in a mass, sometimes in tiers up the trunk, sometimes shining out of a dark hollow.

l. to r.: Rooting Collybia *(C. radicata)*; Broad-Gilled Collybia *(C. platyphylla)*. Edible. Summer. ½ *nat. size.*

Collybias

One of the common, wet-weather mushrooms is the Rooting Collybia with its tall, thin, fibrous stem on top of which is perched a flattened cap. The gills are of varying lengths, not attached to the stem. There is no ring or veil; the stem is long and slender, and it ends in a long root-like projection in the ground—this is one of its chief identifying marks. The cap is whitish or usually tinged gray or brown on top, and it is sticky when wet. It often is four or five inches broad and is rather thin and brittle. *Collybia radicata* grows in woods and occasionally on lawns during the summer and autumn, especially after rains have moistened the sun-baked earth.

A Collybia which is almost entirely different in appearance is the stout, short-stemmed *Collybia platyphylla* or Broad-Gilled Collybia. The gills, which are so broad that they serve to identify the mushroom, are deep and rather thick, widely spaced, and are toothed and scalloped on the edges. The mushroom is pale brown above and the gills are ivory; with age the whole mushroom turns a rich brown. In wet weather it almost disintegrates at a touch, for in spite of its stout appearance, it is a fragile fungus. It is found in decaying wood and leaf-mold from springtime to late autumn.

Velvet Stems ***(Collybia velutipes).*** **Edible. Autumn, winter.**
2/3 nat. size.

Velvet Stems

Along the pond or in the valley bordering the river, the willow trees in autumn drop their leaves to lie in a crackling, curly carpet on the ground. On the trunks of many a willow both alive and dead, in autumn spring forth the orange clusters of Velvet Stem Mushrooms. They are typical of willows in particular, though elms and some other trees also may have them.

The Velvet Stem comes forth in a cluster. The tough, fibrous stems are covered with a brown velvet below, which changes to orange or pale yellow where it joins the cap, and in this area the velvet is absent. The orange cap is sticky on top, tinged in the center with brown, and the gills are pale yellow, whitish or very pale tan, forked, and placed closely together.

The Velvet Stem is edible. It may be found even throughout freezing weather: at most seasons except in summer it is an abundant mushroom. In January or February, a period of mild winter weather will bring it out.

The stems of this mushroom usually are too tough and tasteless to eat, but the caps are considered by many to be a delicacy.

Velvet Stems are a part of the winter landscape. There on the willows in lowland and along the river, where the dry leaves crackle underfoot and the hammering of a woodpecker is loud, the shining clusters of small orange mushrooms are decorative and gay.

Silky Volvaria *(Volvaria bombycina)*. Edible. Summer. ¾ *nat. size.*

The Silky Volvaria

Out of the black hollow of a maple along the city street, one day, a magnificent mushroom grows. The mushroom at first is visible only as a large white egg of beautiful proportions. In a few days the egg has grown even bigger—perhaps it is four inches across—and it has opened in a bell shape and stands on a graceful stem which emerges from a large soft cup. The entire cap is covered with soft silky hair. The gills, which are very close together, are a delicate flesh color.

This is the Volvaria. When it is full grown the cap may expand to seven or eight inches to become one of the most spectacularly beautiful of the mushrooms.

Although the cup around the base might indicate that it is a poisonous species, the Volvaria is edible.

Aside from its edibility, this rare mushroom possesses an undeniable esthetic value. The perfection of its silky cap, the fragility of its gills, the grace of its stem, the thin silk of the wrapper around the base, seen against the backdrop of a dark, decayed, or burnt-out cavity of a tree, contrive to make it a choice "collector's item" among beautiful things in the wild. At times it does not grow in a hollow tree, but may live in leaf-mold, rotting wood, or in deep, shadowy ravines. It appears here and there, never commonly, through the summertime and autumn.

Fawn-colored Pluteus ***(Pluteus cervinus).*** **Edible. Autumn.**
¾ nat. size.

The Fawn-Colored Pluteus

Many a mushroom is found in a certain location which distinguishes it almost as well as shape, gill-pattern, color, or odor. Just as the Velvet Stem is characteristic of the willow, the Oyster Mushroom of the elm, and the Agaricus of the pasture, so is the Fawn-colored Pluteus a native of the old sawdust pile left by a defunct sawmill. The mushroom is found elsewhere, too, usually on a base of rotting wood, but seldom does it grow as luxuriantly or as abundantly as on the rich compost of rotting sawdust.

The Pluteus sometimes is a large mushroom, sometimes small, with a cap varying from two to five inches in width, and a stem often seven inches long. The cap at first is bell-shaped, then expands flat; the surface often is silky, varying from white through shades of pale yellowish, grayish, brownish, or black-brown. It is a trifle sticky in damp weather, glossy and sometimes cracked on top in dry weather. The flesh is white. The gills are white when the mushroom is young, but soon they turn pinkish, then pale brown. The gills are entirely separate from the stem, and the stem itself often is larger at the bottom than at the top. The brittle stem has no ring.

Fat Pholiota *(Pholiota adiposa)*. Edible. Autumn. *2/3 nat. size.*

The Fat Pholiota

It is a brilliant egg-yolk yellow—the Fat Pholiota in the autumn woods. In October and November when the towhees still scratch in the fallen leaves, and daily the quota of robins grows less and less, the appearance of these gay mushrooms on an old tree trunk marks a turn in the year.

They are not common: the most brilliant colors seldom are. These mushrooms are the color of a buttercup, of a yellow butterfly, of a marsh marigold, and like flowers they shine in the woods. The bright color extends from cap to the end of the stem, but the flesh inside is white.

The cap of the Pholiota is decorated with small tufts of scales which are a guide to identifying the mushroom. The skin is sticky and the mushroom itself is firm and fleshy. The yellow gills are attached to the stem, but there is no real ring around the stem. The Fat Pholiota is edible.

Although this mushroom often is found on living trees, on which it is very destructive, it commonly grows upon dead wood and is one of the contributing agents to the breaking down and decay of plant material in the woods. The devouring, disintegrating action of mushrooms is essential here to prevent the forests of the land from becoming too cluttered with dead wood.

Pasture Mushrooms (five) ***(Agaricus campestris).*** **Edible. Far right:** ***(Panaeolus campanulatus).*** **Poisonous. Summer, autumn.** $\frac{3}{4}$ ***nat. size.***

Pasture Mushrooms

They are found not only in pastures but on lawns and golf courses and in parks; here the squat umbrellas of the common *Agaricus* grow up half hidden in the grass.

At first the Pasture Mushroom appears as a white or pale brown button form, a knob that may be flaked with brown on the top. The cap is curved tightly and fastened with a thin veil to the stem, so that it appears to be all in one piece. Because the deadly mushrooms also assume this button form in their early stages, it is often not advisable to gather any buttons for food.

Soon, however, the cap of the Pasture Mushroom expands. The veil splits and leaves a ring around the stem as the cap, with curled-over edge, spreads wide. Now the gills are pale pink and satiny. In a short time they turn pink-brown; when the cap flattens, the gills grow dark brown or black, and at this stage the mushroom has passed the point of edibility.

This is the mushroom from which the popular cultivated mushroom, which is grown commercially in caves, old mines, and cellars, is derived. The best qualities of the wild *Agaricus* have been concentrated in a large, meaty mushroom which, although full of mushroom flavor, has lost through cultivation the delicate, elusive flavor of the wild. *Agaricus placomyces* is taller, has bright pink gills, a flat brown cap, and often grows in the woods.

Uncertain Hypholoma *(Hypholoma incertum)*. Edible. Summer. *Nat. size.*

The Uncertain Hypholoma

From springtime until autumn, in showery weather, the little fragile Hypholoma appears here and there in grassy places. It grows in groups almost like the Mica Cap, or in tufts of twos and threes, or singly among the grass blades. *Hypholoma incertum* is a delicate, easily broken mushroom that blackens and fades away in a short time. It is among the edible species common to Illinois.

Superficially it looks rather like a Mica Cap, but the cap is larger, spreads wider, is more umbrella-shaped. Often, to be further distinctive, it flattens out and splits on one side; it is white, grayish-white, or yellowish-white, darkest on the peak of the cap.

Because this small mushroom may be confused with a number of others with somewhat similar umbrella-shaped caps, it is well to know the details which distinguish it from all others. In *Hypholoma incertum* the brittle white stem is hollow and it splits lengthwise when broken. The cap, too, splits, and the gills beneath the cap at first are white. Later as the cap expands, they become almost as pink as the gills of the Pasture Mushroom. When the spores are ripe and the mushroom is almost ready to wither away, the pinkish color changes to purple-brown.

This little Hypholoma is one of the denizens of the lawn, one of the mysterious visitors which appear apparently over night. These mushrooms grow silently and quickly, so that only the watchful eye detects their coming and going, their rapid cycle from bud to ink.

Brick Tops ***(Hypholoma sublateritium).*** **Edible. Late autumn.**
2/3 nat. size.

Brick Tops

When the elaborate clusters of the edible Brick Top mushrooms appear around the base of a large tree in late autumn, they set a spot of bright color on a cool, gray, autumn afternoon.

This is one of the latest mushrooms of the year. It is stout, with hard flesh and firm gills, and the cap is a dark terra-cotta color which often shades to a paler hue or to pale yellow on the incurved margin. The flesh is yellowish or greenish white, and the gills extend to the stem and usually are attached to it; they are close together and yellowish-white at first, are greenish when mature, brown when old. The stem tapers toward the base and is fibrous and stuffed inside, although old specimens often are hollow. The stem is a lighter shade of the same brick color found on the cap, darker at the base where a group of stems springs up together; the stem shades to a pale yellow or white where it joins the cap.

Brick Top mushrooms are part of the late autumn woods when the silence which comes after killing frost is all about, and where there now is little color. Here the ruddy caps of a colony of these fungi, with their delicate shadings and autumnal over-tones, shine out in the cool November sunshine.

Shaggy Manes *(Coprinus comatus)*. Edible. Late summer, autumn. ¾ *nat. size.*

Shaggy Manes

After October rains have put purple flowers on the violet plants and started witch hazel to blossoming, there come large white mushrooms called Shaggy Manes.

They start up like white eggs set magically on end, but in a short time they show a stem, grow taller, and like stout, closed, shaggy umbrellas stand up in the dark green pasture grass. By next morning, perhaps, the umbrellas have opened limply; now they drip black ink. The hollow white stalks outlive the caps, but they, too, soon tumble over and in a smudge of black are gone. This black, ink-like juice into which the Shaggy Mane liquifies, long ago actually was used as ink.

The Shaggy Mane is one of the common edible mushrooms to be found in spring and autumn in Illinois. The mushroom is closely related to the tight clusters of small, pale-brown Mica Caps and gray Inky Caps which in wet weather spring up around old tree stumps. The entire Coprinus family is non-poisonous and generally is mistaken for nothing else in the mushroom world. However, as in other mushrooms and other foods, the Shaggy Mane if it is to be eaten must be fresh, must be pearly gray or white, not black, under the cap.

l. to r.: Mica Caps *(Coprinus micaceus)*; Inky Caps *(Coprinus atramentarius)*. Edible. Spring to autumn. *2/3 nat. size.*

The Inkies

They are quick to come and quick to fade away in ink. They may be abundant where there is moisture, where there is dead wood or the remains of a dead tree in a lawn, in woods, along city streets, almost anywhere that a mushroom can grow. They are one of the mushrooms most often looked upon as "toadstools," yet they are among the easiest to identify, and among mushroom fanciers they are popular as food.

These two are the Mica Cap and Inky Cap, though the latter name often is used interchangeably for both. The Mica Cap usually is the more common of the two. It springs up in tight clumps around bases of trees or on lawns during the rains which come in spring, summer, and early autumn. The caps are fragile, pale golden-brown or gray-brown, usually sprinkled with shining bits of skin which sometimes sparkle like mica. Creases and fine lines usually mark the cap from peak to edge. The gills are first white, rapidly turn silvery gray, then darker gray, then black and inky.

Quickly in humid weather the clumps of Mica Caps spring up, expand, blacken, disappear, sometimes within a day or day-and-a-half, sometimes longer if the weather is cool. They are edible.

Larger than the Mica Cap, the Inky Cap also grows in clusters or in small groups, but is not so common. The cap is silvery gray, or scaly gray-brown, or almost white, and the gills are pearly; they turn black and dissolve in ink even faster than the Mica Cap.

Stinkhorn *(Phallus impudicus)*; Orange Stinkhorn *(Mutinus caninus)*. Not edible. Summer. *2/3 nat. size.*

The Stinkhorns

In spite of an overpowering and often nauseating odor, the Stinkhorns are so interesting in form and color that this fact may override the disagreeableness of their other characteristics. With both, however, the odor does not develop until the spores are ripe and ready to be dispersed by the little carrion flies which, attracted by the odor, visit it eagerly in numbers.

The Common Stinkhorn first appears as an egg-shaped object covered with a loose purplish skin. The egg is half-hidden in the grass or earth. The skin soon splits and from the gelatinous slime inside there grows a spongy white stem topped with a pitted, olive-brown cap. Some species have a lacy white veil hanging below the cap, while others have none. The soft skin of the egg-shaped base remains around the bottom of the stem. Although there might be a faint and superficial resemblance to the Morel, the Stinkhorn actually has little in common with it.

The Orange Stinkhorn is strikingly colored as it rises from the dark floor of the woods. This mushroom, too, starts from an egg-shaped, white base. When the mushroom stands erect, the upper part of the tapering body is bright red-orange, shading to white near the base. The Orange Stinkhorn has the same foul odor which is characteristic of these mushrooms, though often it is not as pronounced in Mutinus as in Phallus.

l. to r.: Brain Puffball *(Calvatia craniiformis);* Gemmed Puffball *(Lycoperdon gemmatum);* Pear Puffball *(Lycoperdon pyriforme).* Edible. Summer, autumn. ½ *nat. size.*

The Puffballs

Sometimes in a favorable season, the Puffballs in their greatest abundance spring up by hundreds in park and woodlot, on lawn and in field—plump, smooth, brown-skinned Puffballs that range in size from an inch to a foot in diameter.

Now in late summer and autumn they are turgid with moisture which comes with the rains; now Puffballs grow so fast they sometimes split their skins, or they produce freak twins, or forms that remind one of a muffin which has run over the edge of its cup.

A Puffball is a stemless mushroom which is edible as long as it is a solid mass of white inside. It is a globular creation of white meat covered with a tough, brittle skin, and at the base it looks like a sack tied together with a string. The whole thing grows from a white network called mycelium, which from a single spore develops in the ground. Millions of spores, which in fungi take the place of seeds, form in the Puffball, and when the interior dries to powder, the ripe spores are released on the wind. When the right combination of warmth, soil, and moisture occurs, a Puffball may reproduce itself nine million times, but there is too high a mortality rate among spores for this startling event ever to happen. If all fungus spores developed unchecked, the world long since might have been given over to the mushrooms.

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